

REMARKS

Claims 1-29 are pending. Claims 30-31 were withdrawn in response to a prior restriction requirement. In an Office Action mailed September 19, 2006, the pending claims were rejected as anticipated by U.S. Patent No. 6,289,334 to Reiner et al. ("Reiner"). Claims 11-14 were also rejected under 35 U.S.C. §101 as directed to non-statutory subject matter. Claims 15-19 were also rejected under 35 U.S.C. §112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Applicants thank the Examiner for initialing the Information Disclosure Statement filed May 26, 2005.

35 U.S.C. §101 REJECTIONS

Claims 11-14 were rejected under §101 as directed to non-statutory subject matter. The Examiner asserts that these claims are non-statutory "absent an explicit and deliberate definition in the specification for the claimed means," and that the claims are "direct[ed] to software per se and [are] non-statutory." Office Action, p. 3, lines 1-3. Applicants respectfully disagree. The claims recite "a computer," which clearly is a machine. The fact that some or all of the recited means-plus-function limitations could be implemented in software does not render the claims non-statutory.

Applicants note that the specification discloses structures corresponding to the recited means at Figs. 2A-2D and 3 and paragraphs 0033-0036 of the specification. Applicants also note that "structure corresponding to a means-plus-function limitation may be implicit in the written description if it would have been clear to those skilled in the art what structure must perform the function recited in the means-plus-function limitation." M.P.E.P. §2181, Part II; *see In re Dossel*, 115 F.3d 942, 946-47 (Fed. Cir. 1997) (stating that "a unit which receives digital data, performs complex mathematical computations and outputs the results to a display must be implemented by or on a general or special purpose computer"; holding that structure was inherent even where written description did not state a computer or equivalent phrase). One of skill in the art would certainly understand that the means recited in the claims could be implemented by or on a computer. Withdrawal of the rejection and reconsideration is respectfully requested.

35 U.S.C. §112 REJECTIONS

The Examiner rejected claims 15-19 under 35 U.S.C. §112, second paragraph, asserting that “machine-readable medium” renders the claims indefinite. Office Action, p. 3, lines 16-17. These claims have been amended to recite “a machine-readable storage medium having stored thereon a plurality of instructions.” The “storage medium,” previously implicit in the phrase “having stored thereon” has been made explicit by the present amendment. The scope of the claims is unchanged, and no new matter has been added. The claims are not indefinite, and withdrawal of the rejection is requested.

35 U.S.C. §102 REJECTIONS

REINER DOES NOT TEACH OR SUGGEST A PARTITIONING FIELD POPULATED BY RANDOM NUMBERS.

Applicants respectfully request withdrawal of the rejection of claims 1-29 because the cited art does not teach or suggest all the elements of the claims. The claims relate to random *data*; Reiner describes *operations* performed in a random order. As explained in more detail below, the claims recite a partitioning field populated by random numbers, whereas Reiner merely suggests that rows of a database table may be loaded in a random order. Reiner’s disclosure does not relate to the random numbers recited in the claims.

Claim 1 is exemplary. It recites, in relevant part:

dividing a received query on a database table into a number of parallel subqueries, each parallel subquery including a discrete non-overlapping range constraint **on a partitioning field** of the database table • • •

wherein **the partitioning field is populated by random numbers.**

The Examiner asserts that Reiner teaches a partitioning field populated by random numbers at col. 28, line 67 – col. 29, line 6; col. 4, lines 30-42; and col. 29, lines 31-43. *See* Office Action, p. 5, lines 6-8, 11-12, 15-17. This is incorrect.

Reiner’s reference to a random hash sequence describes an order of operation; it does not describe the context of data in a database. Reiner states:

[W]hen you load the table you get an overflow chain for each key value that has at least N blocks • • • . If you load the table cleverly (and we'll need some further experimentation to define cleverly in this context, but **probably loading in random hash key sequence** will work, if your order of extents round-robins through the files), you end up with the blocks for each overflow chain well-distributed among the files of the partitioned table.

Col. 28, line 64 – col. 29, line 6 (emphasis added). In Reiner's method, the rows of a table are **loaded** in random order to create overflow chains. These chains are then well-distributed among files stored in different physical locations. (Reiner's "partitions" refer to "data partitions contained on separate disk drives." See col. 2, line 53 – col. 3, line 9.) Reiner does not teach or suggest that this random loading order is related to a partitioning field **populated by** random numbers. The fact that rows may be **loaded** into a table in random order does not suggest that the table includes a partitioning field, or that a partitioning field is populated by random numbers.

Elsewhere, Reiner provides an example that partitions data simply on a row identifier (ROWID):

[The query SELECT * FROM HASHED_TABLE WHERE HASHKEY_COLUMN=5] would be decomposed into parallel subqueries of the form:

```
SELECT /*+ INDEX(HASHED_TABLE REGULAR_INDEX) */ *  
FROM HASHED TABLE WHERE HASHKEY_COLUMN=5  
AND ROWID >= <low end of range>  
AND ROWID < <high end of range>.
```

Col. 29, lines 31-44 (emphasis added). The method partitions a query by a row identifier (ROWID), depending on whether a row is in the "low end" or "high end" of row identifiers. There is no teaching or suggestion that the row identifiers are random numbers. In fact, Reiner suggests otherwise at columns 105-108, where the same example is given with specific values for the low end and high end of the range:

```
SELECT /*+ INDEX(HASHED_TABLE REGULAR_INDEX) */ *  
FROM HASHED TABLE WHERE HASHKEY_COLUMN=5  
AND ROWID >= '0.0.1'  
AND ROWID < '0.0.2'.
```

Col. 107-108 (emphasis added). These row identifier values select all rows stored in the first partition of a table, i.e., a first physical storage location. *See* col. 3, lines 17-30; col. 2, line 53 – col. 3, line 9. There is simply no suggestion in Reiner that parallel subqueries can or should include a constraint on a **partitioning field** that is **populated by random numbers** as recited in the claims.

Claims 11, 15 and 20 recite elements similar to claim 1, and are allowable for at least the same reasons. Specifically, these claims also recite a **partitioning field populated by random numbers**. Withdrawal of the rejection and reconsideration of the claims is requested.

**REINER DOES NOT TEACH OR SUGGEST SUBSTANTIALLY UNIFORMLY DISTRIBUTED
RANDOM NUMBERS.**

With respect to claim 4 and 23, the Examiner asserts that Reiner discloses random numbers that are distributed substantially uniformly at col. 4, lines 30-42. Office Action, p. 5, lines 11-12. This is incorrect. Reiner's disclosure of hash buckets does not relate to random numbers at all, but rather to storage locations. Reiner states that

the hashing element stores the data records in hash bucket regions that are sized so as to create as least one overflow hash bucket region per root bucket region, and such that **overflow bucket regions** for a given root bucket region are distributed roughly evenly **across different storage partitions**.

Col. 4, lines 37-42 (emphasis added). Data records stored in the database are grouped into hash bucket regions that are smaller than the number of records. The "extra" records are further grouped into overflow bucket regions, and these regions are distributed evenly across storage partitions. There is no suggestion in Reiner that these overflow bucket regions are related to **random numbers** in a **partitioning field** as recited, for example, in claim 4. Furthermore, the regions are distributed evenly across physical storage partitions, **not** within a partitioning field of a database table. In fact, the regions **cannot** populate a partitioning field, since each region contains multiple data records, and each data record contains multiple fields. Reiner simply fails to disclose this subject matter, and the claims are not anticipated.

Dependent claims 2-10, 12-14, 16-19 and 21-29 also include all the limitations of the independent claims and are allowable for at least the reasons given above with respect to the independent claims. Withdrawal of the rejections and reconsideration is respectfully requested.


CONCLUSION

Based on the above remarks, Applicants believe the claims are in condition for allowance. The Commissioner is authorized to charge any fees or credit any overpayment to the deposit account of Kenyon & Kenyon LLP, Deposit Account No. 11-0600.

The Examiner is invited to contact the undersigned to discuss any matter concerning this application.

Respectfully submitted,

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